California High-Speed Rail System

2016 SUSTAINABILITY REPORT
GRI CONTENT INDEX AND SUPPLEMENT

DECEMBER 2017

Prepared by

for the California High-Speed Rail Authority

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1 Introduction

The California High-Speed Rail Authority's 2016 Sustainability Report is presented in two parts:

- 2016 Sustainability Report – An outline of the many ways that the Authority is addressing our sustainability priorities and up-to-date performance information
- GRI Content Index and GRI Supplement – A technical appendix to the 2016 Sustainability Report, which contains additional sustainability performance and management details in accordance with GRI G4 Sustainability Reporting Guidelines

2 GRI Content Index

This index allows GRI report users to quickly find the disclosure information they are seeking. The GRI indicators listed correspond to the information that the Authority's stakeholders noted was important to disclose.

2.1 General Standard Disclosures

	Section	External Assurance
STRATEGY AND ANALYSIS		
G4-1 CEO statement	2016 Sustainability Report, p. 5-6	No
ORGANIZATIONAL PROFILE		
G4-3 Organization name	2016 Sustainability Report, p. 1; Who We Are	No
G4-4 Primary brands, products, services	Who We Are	No
G4-5 Location of headquarters	Who We Are	No
G4-6 Number and names of operating countries	Who We Are	No
G4-7 Nature of ownership and legal form	Who We Are	No
G4-8 Markets served	Who We Are	No
G4-9 Organization scale	Business and Management; Who We Are	No
G4-10 Employee demographics	Who We Are	No
G4-11 Percentage of employees covered by collective bargaining agreements	Business and Management	No
G4-12 Supply chain description	Who We Are	No
G4-13 Significant changes during the reporting period	Who We Are	No
G4-14 Precautionary approach	Report Information	No
G4-15 External charters and principles endorsed	Our Sustainability Approach	No
G4-16 Association memberships	Our Sustainability Approach	No
IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES		
G4-17 Entities included in the organization's consolidated financial statements	Report Information	No
G4-18 Process for defining report content	What Matters Most	No

	Section	External Assurance
G4-19 Material Aspects	What Matters Most	No
G4-20 Aspect Boundaries within the organization	What Matters Most	No
G4-21 Aspect Boundaries outside the organization	What Matters Most	No
G4-22 Restatements	2016 Sustainability Report, p. 17	No
G4-23 Significant changes from previous reporting in Scope and Aspect Boundaries	Report Information	No
STAKEHOLDER ENGAGEMENT		
G4-24 Stakeholder groups engaged	What Matters Most; Stakeholder Engagement	No
G4-25 Basis for stakeholder identification and selection	What Matters Most; Stakeholder Engagement	No
G4-26 Approach to stakeholder engagement	What Matters Most; Stakeholder Engagement	No
G4-27 Key topics and concerns raised through stakeholder engagement	Stakeholder Engagement	No
REPORT PROFILE		
G4-28 Reporting period	2016 Sustainability Report, p. 5; Report Information	No
G4-29 Date of most recent previous report	2016 Sustainability Report, p. 5; Report Information	No
G4-30 Reporting cycle	2016 Sustainability Report. p. 5; Report Information	No
G4-31 Contact	2016 Sustainability Report, p. 8; Report Information	No
G4-32 'In accordance' option chosen	2016 Sustainability Report, p. 8; GRI Content Index; Report Information	No
STRATEGY AND ANALYSIS		
G4-33 Policy and practice on seeking external assurance	2016 Sustainability Report, p. 8; Report Information	No
GOVERNANCE		
G4-34 Governance structure	Who We Are	No
ETHICS AND INTEGRITY		
G4-56 Values, principles, standards and norms of behavior	Our Sustainability Approach; Who We Are	No

2.2 Specific Standard Disclosures

Material Aspect	DMA & Indicators	Section	Omissions	External Assurance
ECONOMIC PERFORMANCE	G4-DMA Generic Disclosure on Management Approach	Business and Management	No	No
	G4-EC4 Financial assistance received from government	Business and Management	No	No
INDIRECT ECONOMIC	G4-DMA Generic and Specific Disclosure on	2016 Sustainability Report, p. 12, 14-15, 27-30; Station	No	No

Material Aspect	DMA & Indicators	Section	Omissions	External Assurance
IMPACTS	Management Approach	Communities and Community Benefit; Business and Management		
	G4-EC7 Development and impact of infrastructure investments and services supported	2016 Sustainability Report, p. 12, 14-15, 27-30; Station Communities and Community Benefit	No	No
	G4-EC8 Significant indirect economic impacts, including the extent of impacts	2016 Sustainability Report, p. 12, 14-15, 27-30; Station Communities and Community Benefit; Business and Management	No	No
PROCUREMENT PRACTICES	G4-DMA Generic and Specific Disclosure on Management Approach	2016 Sustainability Report, p. 29-30; Station Communities and Community Benefit	No	No
	G4-EC9 Proportion of spending on local suppliers at significant locations of operation	2016 Sustainability Report, p. 30	No	No
ENERGY	G4-DMA Generic and Specific Disclosure on Management Approach	2016 Sustainability Report, p. 16-17; Energy	No	No
	G4-EN3 Energy consumption within the organization	2016 Sustainability Report, p. 17; Quantification Methodologies	No	No
WATER	G4-DMA Generic Disclosure on Management Approach	2016 Sustainability Report, p. 22-23; Natural Resources	No	No
	G4-EN8 Total water withdrawal by source	2016 Sustainability Report, p. 22	No	No
	G4-EN9 Water sources significantly affected by withdrawal of water	Natural Resources	No	No
BIODIVERSITY	G4-DMA Generic and Specific Disclosure on Management Approach	2016 Sustainability Report, p. 23; Natural Resources	No	No
	G4-EN13 Habitats protected or restored	2016 Sustainability Report, p. 23; Natural Resources	No	No
EMISSIONS	G4-DMA Generic and Specific Disclosure on Management Approach	2016 Sustainability Report, p. 18-22; Natural Resources	No	No
	G4-EN15 Direct greenhouse gas (GHG) emissions (scope 1)	2016 Sustainability Report, p. 19; Quantification Methodologies	No	No

Material Aspect	DMA & Indicators	Section	Omissions	External Assurance
	G4-EN16 Energy indirect greenhouse gas (GHG) emissions (scope 2)	2016 Sustainability Report, p. 19; Quantification Methodologies	No	No
	G4-EN17 Other indirect greenhouse gas (GHG) emissions (scope 3)	2016 Sustainability Report, p. 19; Quantification Methodologies	No	No
	G4-EN19 Reduction of greenhouse gas (GHG) emissions	2016 Sustainability Report, p. 19-21; Natural Resources	No	No
	G4-EN21 NOx, SOx, and other significant air emissions	2016 Sustainability Report, p. 22; Quantification Methodologies	No	No
EFFLUENTS AND WASTE	G4-DMA Generic Disclosure on Management Approach	2016 Sustainability Report, p. 24-25; Sustainable Infrastructure	No	No
	G4-EN23 Total weight of waste by type and disposal method	2016 Sustainability Report, p. 24; Quantification Methodologies	No	No
COMPLIANCE	G4-DMA Generic Disclosure on Management Approach	Business and Management	No	No
	G4-EN29 Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	Business and Management	No	No
SUPPLIER ENVIRONMENTAL ASSESSMENT	G4-DMA Generic and Specific Disclosure on Management Approach	Station Communities and Community Benefit	No	No
	G4-EN32 Percentage of new suppliers that were screened using environmental criteria	Station Communities and Community Benefit	No	No
EMPLOYMENT	G4-DMA Generic and Specific Disclosure on Management Approach	Business and Management	No	No
	G4-LA1 Total number and rates of new employee hires and employee turnover by age group, gender, and region	Who We Are	Yes	NO
OCCUPATIONAL HEALTH AND SAFETY	G4-DMA Generic and Specific Disclosure on Management Approach	2016 Sustainability Report, p. 25-26; Sustainable Infrastructure	No	No
	G4-LA6 Type of injury and rates of injury,	2016 Sustainability Report, p. 26	Yes	No

Material Aspect	DMA & Indicators	Section	Omissions	External Assurance
	occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender			
TRAINING AND EDUCATION	G4-DMA Generic Disclosure on Management Approach	Who We Are	No	No
	G4-LA9 Average hours of training per year per employee by gender, and by employee category	Who We Are	Yes	No
DIVERSITY AND EQUAL OPPORTUNITY	G4-DMA Generic Disclosure on Management Approach	Who We Are	No	No
	G4-LA12 Composition of governance bodies and breakdown of employees per category according to gender, age group, minority group membership, and other indicators of diversity	Who We Are	Yes	No
LOCAL COMMUNITIES	G4-DMA Generic and Specific Disclosure on Management Approach	2016 Sustainability Report, p. 27-28; Station Communities and Community Benefit	No	No
	G4-SO1 Percentage of operations with implemented local community engagement, impact assessments, and development programs	2016 Sustainability Report, p. 27	No	No

3 GRI Supplement

3.1 Report Information

To ensure that this supplement is transparent and presents meaningful information in a credible and consistent way, the Authority used the world's leading and most widely adopted sustainability reporting framework – the Global Reporting Initiative (GRI) Reporting Guidelines.

This report is written in accordance with the Global Reporting Initiative (GRI) G4 Core Reporting Guidelines. It covers the period from January 1, 2016 to December 31, 2016 and will be updated on an annual basis. The Authority's previous Sustainability Report was published in December 2016, covering the 2015 calendar year. There have been no significant changes in reporting scope and Aspect Boundaries since that previous report.

This report covers the California High-Speed Rail Authority and its activities delivered by key partners, as described in the 2016 Business Plan, Section 3: Business Model (http://www.hsr.ca.gov/About/Business_Plans/2016_Business_Plan.html).

Consistent with the majority of GRI reports, the contents of this report have not been externally assured. The Authority may consider verification or external assurance of future reports as the high-speed rail program advances.

We value all feedback. Please send comments and questions to info@hsr.ca.gov.

3.1.1 Precautionary Principle

The Authority's approach to sustainability and reporting is guided by the precautionary principle. The precautionary approach states that "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." (The Rio Declaration on Environment and Development, 1992). The Authority embodies this principle by developing a responsibly-financed high-speed rail system that will mitigate environmental issues in California and more widely. The system is designed to have a positive impact through net-zero energy use station design, air emissions reductions, habitat protection and responsible material and waste management. The system will follow all applicable state and federal environmental rules and laws, ensuring that potentially negative environmental impacts are considered and mitigated.

3.2 What Matters Most

In 2014, we carried out a materiality assessment to ensure that we report on what matters most to our stakeholders. The assessment validated our existing sustainability priorities and provided clarity on how to respond to increasing requests for information related to our environmental, social and economic activities, in addition to our traditional financial reporting. To identify a list of stakeholders to help us conduct this assessment, we used three criteria which were based on the extent to which each stakeholder group:

- Is interested in, affected by or potentially affected by our activities
- Has the ability to influence the program's outcomes and

- Is invested in the success or failure of the program

To conduct the materiality assessment, we:

- Identified relevant topics by conducting industry research and determining how our Sustainability Framework compared to the reporting practices of our peer rail and transit agencies
- Located the appropriate area where the impacts of those topics occurred
- Conducted interviews with key stakeholders to solicit feedback on which topics were most significant to them
- Analyzed the feedback to prioritize and focus our reporting efforts
- Organized the content of this report accordingly and
- Validated the report content to ensure that it included the outcomes of stakeholder engagement processes and covered significant organizational impacts in a balanced and transparent manner

Stakeholders Engaged During the Materiality Assessment

- California Air Resources Board
- California State Transportation Agency
- California Strategic Growth Council
- Calthorpe Associates
- Peninsula Corridor Joint Powers Board (Caltrain)
- California Department of Transportation (Caltrans)
- Environmental Defense Fund
- Federal Railroad Administration
- Governor's Office for Planning and Research
- Greenlining Institute
- Los Angeles County Metropolitan Transportation Authority
- Southern California Association of Governments
- US Army Corps of Engineers
- US Department of Transportation
- US Environmental Protection Agency

This extensive review revealed environmental, social and economic impacts that matter most to our stakeholders which are shown in Exhibit 1. We recognize that while some of these impacts occur internally (for example, our office energy use), many also have far-reaching effects external to our own operations (for example, running the system on renewable energy). Boundaries for each aspect were determined based on whether their effects occurred within and/ or outside of California High-Speed Rail, as shown in Exhibit 2.

Exhibit 1: California High-Speed Rail Authority Material Aspects

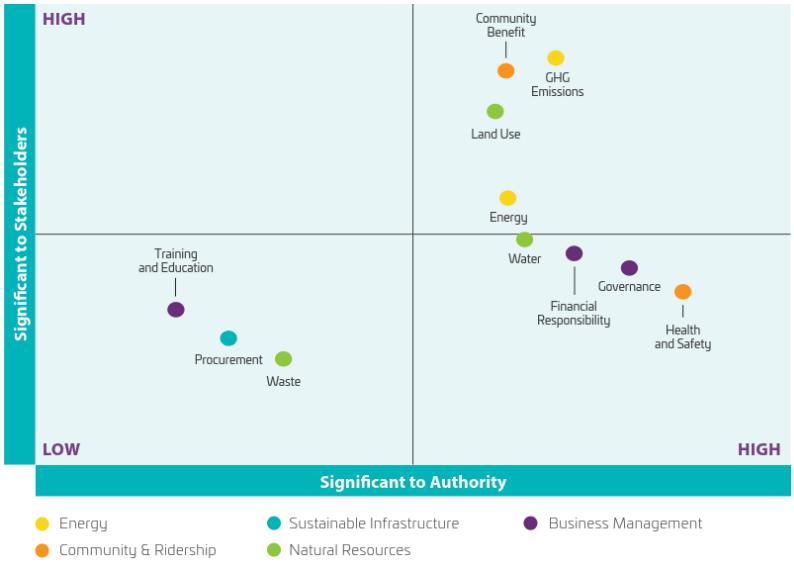


Exhibit 2: Material Aspect Boundaries

MATERIAL ASPECT	BOUNDARY
GHG Emissions	External (Global)
Procurement Practices Materials Supplier Environmental Assessment	External (USA)
Water Effluents and Waste Biodiversity Indirect Economic Impacts Local Communities	External (California)
Environmental Compliance	Internal (California)
Energy	Internal/External (California)
Economic Performance Training and Education Occupational Health & Safety Employment	Internal/External (California)

3.3 Who We Are

The California High-Speed Rail Authority (Authority) is responsible for planning, designing, building and operating the first high-speed rail system in the nation. California high-speed rail will connect the mega-regions of the state, contribute to economic development and a cleaner environment, create jobs and preserve agricultural and protected lands. By 2029, the system will run from San Francisco to the Los Angeles basin in under three hours at speeds of over 220 miles per hour. The system will eventually extend to Sacramento and San Diego, totaling 800 miles and up to 24 stations. In addition, and an essential part of building high-speed rail, the Authority is working with regional partners to implement a

statewide rail modernization plan that will invest billions of dollars in local and regional rail lines to meet the state's 21st century transportation needs.

The Authority is headquartered in Sacramento, California and operates in the United States of America. The Authority is a California state agency established pursuant to the California High-Speed Rail Act (S.B. 1420, Chapter 796 of the California Statutes of 1996) to develop and implement high-speed intercity rail service. It is located under the California Department of Transportation (CalSTA) under Transportation Secretary Brian P. Kelly. There were no significant changes in the Authority's structure or ownership during the reporting period.

Exhibit 3: California High-Speed Rail Organization Chart: Executive Staff (October 2017)

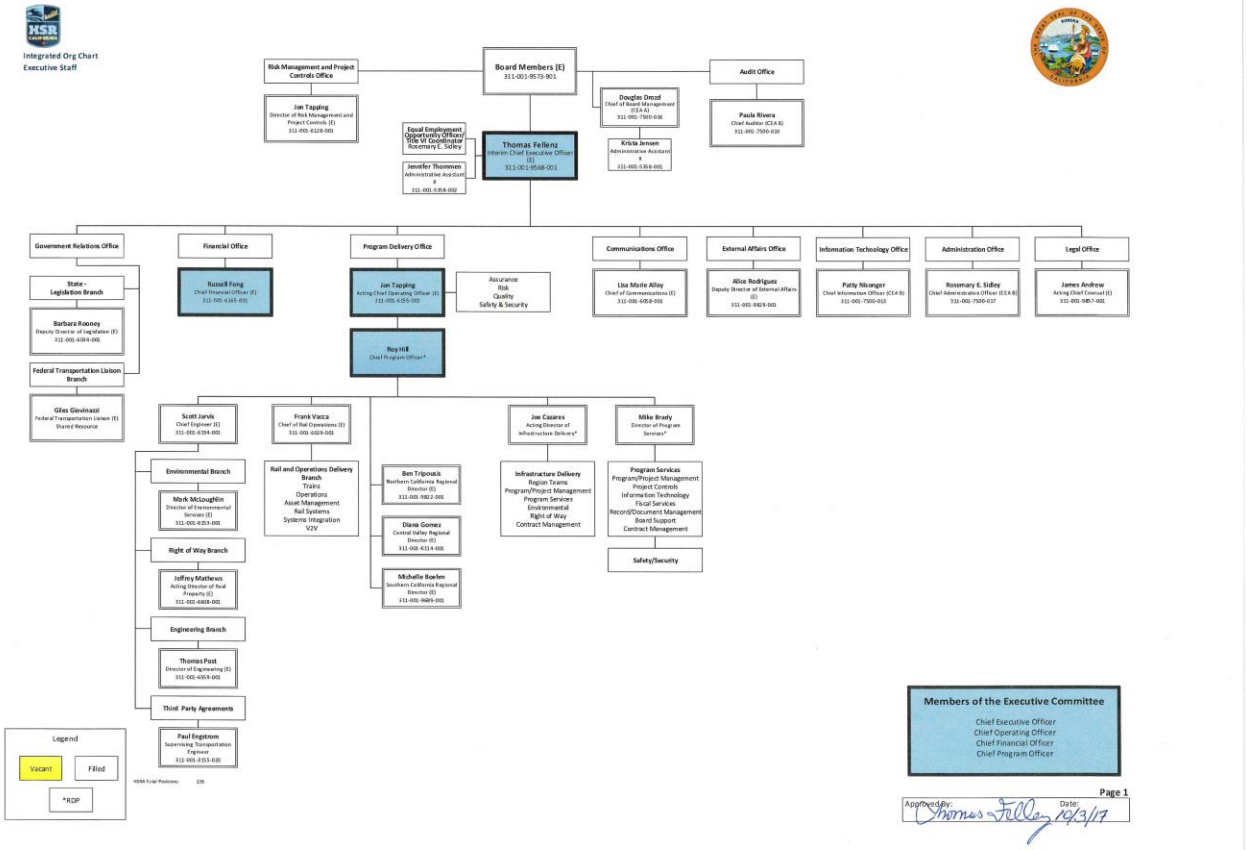


Exhibit 4: California High-Speed Rail Statewide System

3.3.1 Organizational Structure

The Authority's Board of Directors was established in 2003 by California Public Utilities Code 185020 to oversee the planning, construction and operation of the high-speed rail system. During 2016, it consisted of eight members: four members appointed by the Governor, two members appointed by the Senate Committee on Rules and two members appointed by the Speaker of the Assembly. Each Board member represents the entire state and serves a four-year term. There is a Board Chair and currently a Vice-Chair. During 2016, the Board included five men and three women.[1]

The Board of Directors is responsible for setting policy directives, and for the development and approval of the Authority's key policy documents, including business plans, financial plans and strategic plans. The Authority's Chief Executive Officer and Authority staff report directly to the Board of Directors on ongoing program issues.

The Board of Directors also has several sub-committees dedicated to overseeing specific aspects of the high-speed rail program. These sub-committees are:

- Executive/Administrative Committee
- Finance and Audit Committee
- Operations Committee

[1] Board member diversity is not reported by age or minority group.

- Transportation and Land Use Committee

Following the 2016 reporting year, the Authority announced a number of executive transitions in the first half of 2017. Chief Executive Officer Jeff Morales announced he would step down from his position after five years of service, as the high-speed rail program transitions from concept and planning to full-scale construction. The Board of Directors will select a replacement for the departing Chief Executive Officer. Other executive transitions in the first half of 2017 include:

- Ernest M. Camacho was appointed to the Board of Directors, filling a vacancy created when Lou Correa stepped down in late 2016
- Honorable Jim Beall and Honorable Dr. Joaquin Arambula were appointed to Ex Officio Board positions

In 2016, the Governor signed a bill to add two non-voting *ex officio* members to the Board of directors; one member is to be a Member of the Senate, appointed by the Senate Rules Committee, while the other is to be a Member of the Assembly, appointed by the Speaker of the Assembly.

3.3.2 Guiding Principles

The Authority will continue to advance the statewide program on multiple fronts throughout the coming years within a flexible framework and guided by the following principles:

- Fulfill all commitments made to the citizens of California when they approved Proposition 1A to provide a true high-speed rail system
- Evaluate new opportunities – and adapt to changing circumstances – so that a cost-effective, high-quality system can be delivered as quickly and efficiently as possible
- Reduce costs and construction time by using a blended implementation strategy in urban areas where appropriate and consistent with mandated performance goals to:
    - Enhance access and mobility
    - Minimize impacts
    - Reduce costs
    - Improve safety
    - Expedite implementation
- Match projects with available funding and deliver them through appropriate business models:
    - Seek the earliest and best value private-sector participation with appropriate risk management and cost containment
    - Select an initial line for development (as described below), establish a funding plan for it, commit all resources necessary to build it and begin offering high-speed passenger service as quickly as possible
- Advance other strategic early investments in collaboration with Authority partners in order to:
    - Improve the speed, safety and efficiency of existing passenger rail services, and prepare the way for high-speed rail
    - Grow the market for passenger rail travel throughout California
    - Deliver early economic, environmental, mobility, safety and community benefits

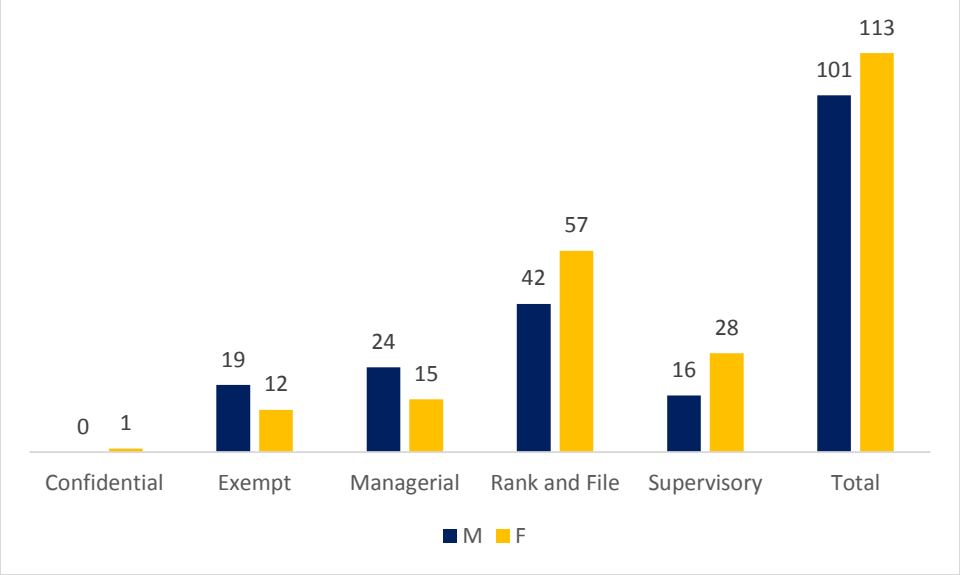
- Promote regional rail and bus connectivity projects
- Leverage funding by collaborating with local partners to advance high priority mutually beneficial projects

The Authority's core values can be found in Section 2 of our 2016 Business Plan, available online at: http://hsr.ca.gov/docs/about/business_plans/2016_BusinessPlan.pdf.

3.3.3 Our Team

As of December 31, 2016, the Authority had 222 employees on staff, including full-time employees, retired annuitants, part-time employees, student assistants and employees on loan from other state agencies. During the reporting period, the only significant variation in staff numbers was due to the addition of new staff and turnover. In 2016, the Authority hired 62 new employees, for a new hire rate of 28 percent. There was a turnover rate of 27% for 2016.[2] The Authority also includes a significant number of private sector consultants integrated with state employees.

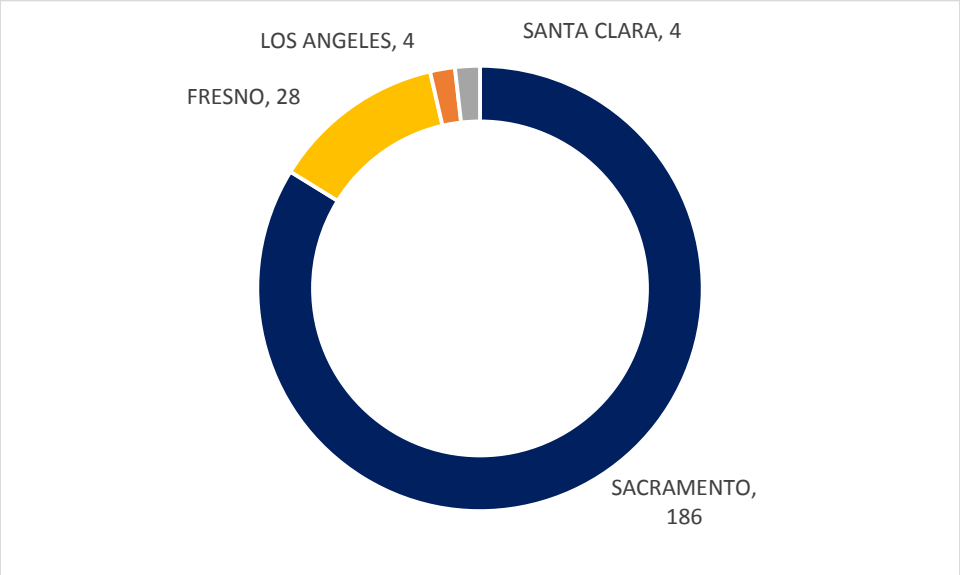
Exhibit 5: Employee Breakdown by Gender and Seniority[3]



[2] New hire and turnover rates are not reported by age group, gender or region.

[3] Employee diversity is not reported by age or minority group.

Exhibit 6: 2015 Employee Breakdown by Region



The Authority provides state employees with training opportunities designed to increase job proficiency and advance careers with the goal of promoting a capable, efficient and service-oriented workforce. This is done by developing employee's skills and abilities through training programs that meet Government Code Section 19995 and the Authority's Policy Directive POLI-HR-21 entitled Employee Training Policy signed in June 2014.[4]

The Authority's policies are consistent with the California Department of Human Resources policies and laws.

3.3.4 How We Operate

Key beneficiaries of the high-speed rail program include everyone living or traveling in the state of California. The Authority is responsible for procuring services, contractors and materials, as well as coordinating the delivery of the high-speed rail program. Our supply chain includes suppliers providing materials, as well as consultants and contractors providing design and construction services to build the high-speed rail system, with the majority of these businesses being locally-based on California. Details of supply chain expenditures are available online via the Finance and Audit Committee materials (http://www.hsr.ca.gov/Board/monthly_fa_committee_meeting.html). The outputs of this work include the physical infrastructure (e.g., rail, trains and stations), as well as outcomes of cleaner air, transit-oriented development and a highly-connected California.

3.4 Our Sustainability Approach

The California High-Speed Rail Authority's approach to sustainability ensures that actions taken today enable current and future generations to lead healthy and rewarding lives. We use a Sustainability Framework, developed through consultation with key state and federal partners, as well as our Board of

[4] Training hours are not reported for 2016.

Directors. The framework serves as the organizational structure for sustainability action and policies. Details on that framework, our Sustainability Policy and implementation can be found at http://www.hsr.ca.gov/Programs/Green_Practices/index.html.

In March 2016, the Authority's Board of Directors adopted the revised Sustainability Policy, which renewed and strengthened the program's commitment to:

- Net-zero greenhouse gas and criteria pollutant emissions in construction
- Operating the system entirely on renewable energy
- Net-Zero Energy and LEED Platinum facilities
- Planning for climate change adaptation
- Prioritizing life-cycle considerations

Exhibit 7 shows our priorities from our Sustainability Framework and the short and long-term objectives we have identified to achieve them. Many of these objectives align with topics identified as important during our materiality assessment.

Exhibit 7: California High-Speed Rail Authority's Sustainability Framework

PRIORITY	OBJECTIVES
Energy	Reinforce a clean energy economy through the use of on-site renewable energy systems at stations
	Strengthen public health by improving air quality
	Maximize the consumption of renewable fuels to the extent feasible
	Promote long-term price stability
	Reduce Vehicle Miles Traveled (VMT)[2]
Natural Resources	Maximize reductions in greenhouse gas (GHG) emissions
	Improve air quality
	Conserve, maintain, and restore habitat and wildlife corridors through landscape scale mitigation
	Conserve agricultural land
	Restore and maintain ecosystem health
	Reduce the demand for virgin natural resources through the use of recycled materials
Sustainable Infrastructure	Design, construct, and operate infrastructure in conformance with Authority principles for sustainable infrastructure
	Design, construct, and operate facilities that cost-effectively achieve State of California and local energy and sustainability policies
	Design, construct, and operate resilient systems and facilities that can adapt to changing climate conditions
	Protect employee and customer health during construction and operations
Station Communities & Ridership	Provide convenient station access to all high-speed rail station areas
	Design and construct stations and infrastructure that reinforce Sustainable Community Strategies (Senate Bill 375[3])
	Promote livable development patterns through community partnerships
	Reinforce quality of life through design of the built environment
	Promote active transportation (e.g., walking and bicycling)
	Promote local and regional transit connectivity to high-speed rail stations
Business & Management	Improve the economic value to Californians through increased access and mobility
	Achieve a self-sustaining financial structure
	Achieve continual improvement of delivery and management
	Operate and maintain the system transparently and accountably
	Maximize opportunity for private investment
	Incorporate adaptation considerations into investment decisions

California High-Speed Rail plays an active part in advancing sustainability through the California State Transportation Agency (CalSTA) and through its contribution to state plans and initiatives. We have also forged new and innovative industry partnerships that ensure we provide a state-of-the-art high-speed rail system. Through these partnerships, we are involved with a number of leading initiatives including:

- American Public Transportation Association (APTA): an industry organization whose mission is to strengthen and improve public transportation through advocacy, innovation and information sharing. Through participation in APTA's sustainability commitment, we have committed to a core set of actions that enhance sustainability.
- International Union of Railways (UIC): the world-wide professional association representing the railway sector and promoting rail transport. In August 2015, the Authority has signed onto the UIC's Railway Climate Responsibility Pledge.

In 2016, we participated in the inaugural assessment of the environmental, social and governance (ESG) performance of infrastructure assets – the GRESB Infrastructure Assessment. We also used sustainable infrastructure rating systems, such as Envision, and assessed the high-speed rail program using other global sustainable infrastructure metrics. The Authority participated in the GRESB Infrastructure Asset Assessment again in 2017 and maintained the high-speed rail program's standing among leading infrastructure projects in North America.

4 Sustainability Priorities

The rest of this GRI Supplement is organized by the five priorities under the Authority's sustainability framework for the high-speed rail program:

- Energy
- Natural Resources
- Sustainable Infrastructure
- Communities
- Business and Management

Some sustainability issues are relevant to more than one area. For example, the program's procurement practices could be reported under Communities because they benefit local communities, or under Business and Management as they pertain to how the business is governed. For consistency and transparency, topics are reported under the same priority sections in both the 2015 and 2016 Sustainability Reports.

4.1 Energy

The Authority uses energy in its offices and for construction.

4.1.1 Designing Net-Zero Energy Stations

We are committed to using clean energy efficiently. All high-speed rail stations will be high performance buildings certified using Leadership in Energy & Environmental Design (LEED®). High-speed rail stations and service facilities will be designed to be net-zero energy, meaning they will produce at least as much energy on-site as is consumed over the course of a year. Energy supply may come from integrated photovoltaics and solar thermal applications. Good passive solar and energy efficiency design will also reduce energy demand.

Above and beyond those efforts, the Authority is also developing plans for how excess energy produced at stations can help achieve more restorative development in station districts. Working towards net-positive energy facilities includes partnering with adjacent developments and helping our local partner communities reach important milestones for renewable energy and sustainability.

4.1.2 Committing to Renewable Energy

We have committed to using 100 percent renewable energy to operate our trains and facilities. Over the past several years, we have worked with state partners, such as the California Energy Commission, to

better understand the use and availability of renewable energy to supply the system's needs over the life of the project. Energy Commission analysis of state renewable energy data and trends illustrates that California's abundance of renewable energy resources provides sufficient accessible capacity beyond what is needed for California's renewable portfolio standard (RPS) to meet the relatively small demand needed to operate the high-speed rail program. To advance our commitment to use 100 percent renewable energy to operate trains and facilities, we are working with the California Public Utilities Commission (CPUC) and the California Independent System Operator (CAISO) to keep abreast of regulatory trends and requirements.

In 2016, the Authority executed a renewable energy memorandum of understanding with the California Energy Resources Conservation and Development Commission which details our strategy and implementation plan for achieving our renewable energy goal. This agreement will help facilitate the use of renewable energy, the delivery of zero net energy buildings and incorporation of zero emission vehicle infrastructure in California as part of the high-speed rail system.

4.1.3 Regulatory Compliance

All California high-speed rail systems and facilities are or will be subject to the following energy-related policies, laws, standards and regulatory guidelines:

- California High-Speed Rail Authority Policy Directive Poli-Plan-03 on Sustainability
- California 2013 Building Energy Efficiency Standards
- 2010 California Green Building Standards Code (CalGreen Code) Title 24, Part 11
- 2008 California Long-term Energy Efficiency Strategic Plan
- Memorandum of Understanding between the Authority and the California Energy Commission
- SB 350 (De Leon, 2015) Clean Energy and Pollution Reduction Act

4.1.4 Energy Use in Authority Offices

We occupy energy-efficient office spaces with metered lighting and computer monitors with automatic shut off functioning, in order to minimize energy use.

Information on our 2016 energy consumption performance is reported in the 2016 Sustainability Report.

4.2 Natural Resources

4.2.1 Maximizing Greenhouse Gas (GHG) Emissions Reductions

The State of California continues to be at the national forefront and is a global leader among subnational jurisdictions in establishing targets for reducing greenhouse gas (GHG) emissions and transitioning to a sustainable, low-carbon future. As such, it plays a crucial role in California's ambitious plan to reduce statewide greenhouse gas (GHG) emissions to 40 percent below 1990 levels by 2030 (Executive Order B-30-15 and California Global Warming Solutions Act – Assembly Bill 32).

GHG emissions associated with the program come from a number of sources, including production of materials used to construct the system, fuel burned in construction vehicles and equipment, electricity consumed in offices, and waste treatment and recycling. In future, GHG emissions will also come from electricity consumed and materials produced for use in rail system operations.

The Authority looks for opportunities to reduce emissions, including: fuel and energy conservation; recycling and reusing steel, concrete and other materials; specifying materials with lower global warming potentials; the use of renewable energy; and direct offset projects such as planting tree, increasing transit service and capturing methane.

Reducing GHG Emissions during Construction

The Authority's approach to GHG management begins with minimizing emissions. As with any infrastructure project, equipment is required for construction. The primary way in which we minimize GHG emissions during construction is through binding contract provisions that construction contractors must meet and which are governed by the Authority's Policy Directive Poli-Plan-03 titled, "Sustainability Policy" (https://www.hsr.ca.gov/Programs/Green_Practices/sustainability.html). This policy includes specific measures to decrease the Authority's indirect (scope 3) emissions associated with construction contractors, materials and waste, such as:

- Minimizing GHG emissions through design requirements
- Achieving net-zero tailpipe GHG emissions in construction
- Requiring Environmental Product Declarations (EPDs) for construction materials, including steel products and concrete mix designs, to improve disclosure of materials information and allowing for the selection of more sustainable products
- Requiring optimized life-cycle scores for major materials, including global warming potential, after satisfying durability and quality requirements
- Adapting existing structures and facilities for reuse whenever feasible
- Integrating climate adaptation and resilience principles into the design, construction and operation of the system.

Measuring what happens on site is critical for managing and improving the construction process. The Authority requires contractors to track and report their use of on-site materials, fuel, water and electricity, recycling and reuse volumes, as well as the type of on and off-road equipment, and hours or miles of operation.

The Authority uses this information to inform subsequent construction procurement documents.

When construction began in 2014, the design-build contractors began submitting information about the sources and amounts of construction materials being used. Construction Package 1 (CP1) structures include durable concrete mix designs using 25 percent fly ash for cement and 100 percent recycled steel with global warming potential scores below industry average.

To offset remaining direct (tailpipe) GHG emissions associated with constructing the initial segment of the high-speed rail system, the Authority is implementing a tree planting program in rural and urban areas of California.

We expect to plant hundreds of thousands of trees through our urban and rural tree planting program. We will carry out this program in partnership with the California Department of Forestry and Fire Protection (CalFIRE) and will target communities that are in the vicinity of the rail system, with special

focus on providing benefits to disadvantaged communities. In addition to further reducing GHG emissions, these trees will improve urban air quality and quality of life, reduce energy use and stormwater runoff, prevent soil erosion and restore habitats.

Our rural tree planting program will also be carried out in partnership with CalFIRE. Native tree species will be planted on lands damaged by wildfires to restore natural ecosystems.

In the near-term, prior to operations, there will be GHG savings associated with early investments being made to upgrade regional rail systems as part of the integrated state-wide rail system, which are referred to as "bookend" and "connectivity" projects. Some of these projects will provide important connections to the high-speed rail system; others will lay the foundation for high-speed rail. These projects include electrification of some existing rail corridors, upgrades to sensor and signal systems, more energy-efficient equipment and processes, and additional grade separations that will reduce emissions and air pollution from idling.

Reducing GHG Emissions during Operations

High-speed rail's most significant contribution to sustainability may be its role in reducing California's GHG emissions by reducing automobile and air travel.

Every mile traveled on high-speed rail would have otherwise been taken in an automobile or an airplane. From the first year of operation, high-speed rail reduces emissions by reducing automobile vehicle miles traveled (VMT), and air trips. VMTs are the total number of miles traveled by vehicles in a given geographic area. The emissions associated with these less efficient forms of travel will be significantly reduced.

Without high-speed passenger rail service in California, the vehicle miles traveled for long distance trips in the state are projected to increase by approximately 11.7 billion miles – to 70 billion miles annually – between 2021 and 2040.

The Silicon Valley to Central Valley portion of the rail line is expected to begin offering passenger rail service by 2025. The positive net impact of high-speed rail on GHG emissions is projected to average at least 1.0 to 1.3 million metric tons of carbon dioxide equivalent avoided per year ($MMTCO_2e$/year) at full system ridership in 2030, equivalent to taking half a million cars off the road each year.[5] More specifically, by 2030, high-speed rail is projected to have cumulatively avoided between approximately 2.1 and 2.8 million metric tons of GHG emissions. This estimate only reflects diverting riders from automobile and air travel, and does not account for a number of ancillary direct and indirect benefits such as the additive effect of compact, infill development in station areas that the system is expected to catalyze. These projected emissions savings reflect our goal of delivering an interconnected, well-

[5] Details of the emissions reduction calculation methodology are available online at: http://www.hsr.ca.gov/docs/programs/green_practices/HSR_Reducing_CA_GHG_Emissions_2013.pdf. All greenhouses relevant to the activities are included (CO_2, CH_4, N_2O). Reductions are reported relative to a scenario without high-speed rail, rather than relative to a baseline year. Emissions reductions occur as a result of the service provided by high-speed rail, so are classified as scope 3 emissions reductions.

designed system that attracts riders and provides safe, reliable, fast travel between California's population and employment centers.

These savings also reflect our commitment to:

- Developing, building and operating infrastructure designed to reduce energy consumption
- Prioritizing energy efficiency in the design of all facilities
- Selecting state-of-art energy-efficient high-speed rail trains
- Using 100 percent renewable for operations, including:
    - Procuring renewable energy for system operations
    - Producing renewable energy on Authority property

Regulatory Compliance

Our role in reducing GHG emissions is detailed in and governed by the following policies and statutes:

- Assembly Bill 32, the California Global Warming Solutions Act of 2006;
- 2016 Senate Bill 32 requiring the Air Resources Board, in adopting rules and regulations, to ensure that statewide GHG emissions are reduced to 40 percent below the 1990 levels by 2030;
- Air Resources Board 2008 Scoping Plan and 2013 Scoping Plan Update which identifies the high-speed rail system as a measure for GHG reduction;
- 2013 Greenhouse Gas Emissions Reduction Fund (Cap and Trade Auction Proceeds) Investment Plan, in which the system plays a key role;
- Senate Bill 862 (2013-2014), Committee on Budget and Fiscal Review. Greenhouse gases: emissions reduction;
- Assembly Bill 1550 (2015-2016) prescribing GHG reduction fund investment in disadvantaged communities

Information on our 2016 GHG emissions performance is reported in the 2016 Sustainability Report.

4.2.2 Protecting Air Quality during Construction

The Authority minimizes air emissions through the fleets used by its contractors. Specifically, all contractors working on the high-speed rail system are required to use fleets that are compliant with California vehicle standards and meet U.S. Environmental Protection Agency standards for the cleanest off-road diesel engines (Tier 4 equipment).. The fleets comply with stringent US Environmental Protection Agency (USEPA) limits on air pollutants to the extent that Tier 4 equipment is available. This requirement was unique among infrastructure projects and pushed the adoption and use of cleaner technology in California in advance of legislated requirements. Voluntary Emissions Reductions Agreement (VERA) is an air quality agreement between the Authority and local jurisdictions responsible for clean air. Under a VERA, each ton of air pollutants emitted during construction of the high-speed rail system is offset within the local air quality district through programs that replace older, polluting equipment such as agricultural pumps, diesel bus engines and tractors with new, cleaner and more efficient equipment. The Authority's VERA program benefits local communities with new, efficient equipment while reducing air pollutants and providing immediate, tangible climate benefits.

Under this program, the design-build contractor for a given construction package submits a list of equipment, as well as the miles driven and hours used per piece of equipment. The Authority assembles this information into a quarterly report to the local air district along with a payment for the dollar value of the emissions. The air district then funds an offsetting project equal to the emissions, such as paying for the replacement of older diesel engines and farm equipment.

To date, VERAs have been set up for Construction Package 1 and 2-3 with the San Joaquin Valley Air Pollution Control District, in the Central Valley, where construction is currently underway. VERA arrangements are planned for all parts of the system that are in districts where there is poor air quality. These efforts are critically important for Central Valley cities, four of which have been identified by the American Lung Association as being among the top ten most polluted cities in the United States in terms of air quality.

Through 2016, agreements with the San Joaquin Valley Air District have delivered 1,006 tons of total lifetime reductions of criteria air pollutant emissions, through $9.15 million invested in various programs, such as the Heavy-Duty Engine Program. The investment supported the purchase of 46 new agricultural tractors and 104 trucks in 2016, which will result in lower levels of criteria air pollutants and black carbon.

Information on our 2016 air quality performance is reported in the 2016 Sustainability Report.

4.2.3 Conserving Water Resources

As with energy, the Authority tracks the use of water by its employees in addition to, and separately from, water used in project construction. Tracking water use remains important as our state faces inconsistent rainfall and snowfall, and ever-increasing demands on water resources from both residential and commercial users.

Water consumption for the high-speed rail program is governed by a range of federal, state and local regulations. As construction extends into other parts of the state beyond the Central Valley, it will be governed by local regulations in Southern and Northern California. As of 2016, the statutes and regulations that the Authority is responsible for complying with included:

- Federal:
    - Clean Water Act of the United States
    - Section 10: Rivers and Harbors Act
    - Floodplain Management and Protection and Flood Disaster Protection Act
- State:
    - 2010 California Green Building Standards Code (CalGreen Code)
    - Porter-Cologne Water Quality Act
    - Statewide Stormwater Permits
    - Streambed Alteration Agreement
- Regional and Local:
    - Fresno County General Plan and Ordinances
    - Kern County General Plan and Ordinances

- Metropolitan Bakersfield General Plan/Update and EIR

The Authority has established criteria for all of its facilities to work toward net-zero potable water consumption through water use reduction, recycling, capture and storage. To support these efforts, water consumption is prioritized when siting future facility locations. In addition, all Authority facilities will be designed and built using CalGreen Code for planning, procurement, design, construction, operations and maintenance, including both its mandatory and voluntary sections.

Several stakeholders have expressed concerns that construction activities could be competing with California farmers for water, which is of particular importance in the Central Valley. To address these concerns, the Authority places high importance on water conservation efforts during the construction phase of the project. Once the system is built, it will not require significant water volumes or threaten water security for the region.

In 2015, the Authority adopted a Water Conservation Policy. In addition, project-specific water conservation requirements were outlined in Book IV, Part C.8 Water Conservation Guidance of the Construction Package 4 Request for Proposal for Design-Build Services (https://www.hsr.ca.gov/docs/programs/construction/CP4_executed/P14_32_IR_IVC_08_Water_Conservation_Guidance.pdf). The document outlined Water Conservation Categories based on the State of California's public drinking water resources at any given time and consists of mandatory requirements and conservation techniques for each category. Contractors are required to submit a Water Conservation Plan for construction which adheres to this guidance.

Comprehensive Environmental Impact Reports (EIR) and Environmental Impact Statements (EIS) are being prepared for each project section of the system in compliance with the National Environmental Policy Act (NEPA) and California's Environmental Quality Act (CEQA) respectively. Each environmental analysis includes an assessment of water consumption and detailed projections of water required for construction. To date, two project sections have been completed (Merced-Fresno and Fresno-Bakersfield) and the rest are underway. The EIR for the Fresno to Bakersfield section found that construction activities will use only six percent of the current water consumption along the corridor. Once construction is complete, this section will use less than two percent of the current water consumption for the project footprint. This represents a net decrease in water use.

At the Authority's offices, water use per person is minimized through the use of low-flow, automatic shut-off sink fixtures and low-flow toilets.

Information on our 2016 water performance is reported in the 2016 Sustainability Report.

4.2.4 Managing Land Use

The Authority is committed to working with local, state and federal agencies and local stakeholders to develop a high-speed rail system that preserves California's open spaces and environmental resources. The Transit and Land Use (TLU) Committee of our Board of Directors is in place to link transportation decisions with land use decisions through interactions with important stakeholders.

Incentivizing land use changes will motivate and inspire urban regeneration. Important changes include allowing mixed land uses, maximizing density and building height, and achieving highest and best land uses associated with a high-speed rail station.

Preserving Agricultural Land

On November 15, 2012, the Authority Board of Directors approved an agreement with the Department of Conservation (DOC) for implementing agricultural preservation. Through this agreement, the DOC will identify suitable agricultural land for mitigating project impacts and fund the purchase of agricultural conservation easements from willing participants. Solicitation for proposals for agricultural mitigation parcels began in November 2014. The DOC's California Farmland Conservancy Program (CFCP) will secure the easements on behalf of the Authority.

Preserving Habitat

The statewide reach of the project provides the ideal opportunity to consider broader approaches to habitat preservation. The Authority has contracted with the Lazy K Ranch, a working horse and cattle ranch in Chowchilla, to secure a 530 acre parcel for habitat mitigation. This is a unique parcel that is contiguous with a much larger site, allowing the expansion and connection necessary for quality habitats and providing a matrix of seasonal ponds, thereby improving the overall quality of the mitigation site.

In addition to the Lazy K Ranch on which a conservation easement was secured, the Authority, working through its contractor Westervelt Ecological Services has recently secured the rights to establish a conservation easement on 820 acres along Cross Creek in Kings and Tulare Counties. This conservation easement will preserve some of the last remaining intact parcels of pristine vernal pool grasslands along an important wildlife movement corridor that supports the California tiger salamander, San Joaquin kit fox, and vernal pool invertebrates.

- To mitigate for impacts on species listed under the federal and state endangered species acts, approximately 400 acres of existing seasonal ponds and annual grasslands will be preserved.
- To mitigate impacts on regional waters, 17 acres of seasonal ponds will be created across an approximately 100-acre area that had previously been leveled for agriculture.
- To mitigate impacts on non-wetland stream-side areas, three acres adjacent to the Chowchilla River will be planted and enhanced adjacent to one acre of existing vegetation.

These areas will be protected in perpetuity with the establishment of conservation easements over the property and the assurance that necessary and appropriate long-term management activities are conducted. Additional areas of the site will be used for staging and collection of seasonal pond materials.

During 2016, an additional 410 acres were protected, for a total of more than 2,000 acres of habitat protected in perpetuity as of the end of 2016.

Having identified key habitat areas for mitigation in Southwest San Diego County, the Authority is now assessing regionally significant conservation areas statewide. By the end of 2017, the Authority will have

regional mitigation strategies in place in order to advance construction in a way that preserves biodiversity.

Additional information on habitat protection is reported in the 2016 Sustainability Report.

4.3 Sustainable Infrastructure

4.3.1 Authority Principles for Sustainable Infrastructure

The Authority's sustainable infrastructure principles reflect a balance of social, environmental and economic issues relevant throughout the design, construction and operations phases of the program. In line with peer organizations, these principles were developed in consultation with leaders across functional areas of the Authority to represent and reflect California's priorities. We will be a leader in delivering sustainable infrastructure in the state of California – and set a national example – through our commitments.

Sustainable infrastructure can refer to a variety of priorities and objectives so California High-Speed Rail has defined its sustainable infrastructure principles, founding them on global best practices, stakeholder priorities and California state regulations.

The following principles encompass the Authority's commitment to sustainable infrastructure:

- Make energy efficiency a priority in design.
- Use 100 percent renewable energy for operation.
- Design and construct high-performance facilities that achieve net-zero energy for operations and are LEED certified at the Platinum level.
- Maximize GHG emission reductions through design and requirements and achieve net-zero GHG (tailpipe) and criteria pollutant emissions in construction
- Follow operations practices that maintain or improve air quality.
- Maximize station access for pedestrians, cyclists and transit riders.
- Integrate climate adaptation and resilience principles into the design, construction and operation of the system.
- Require Environmental Product Declarations for construction materials, including steel products and concrete mix designs, to improve disclosure of materials information and incentivize the selection of better environmental performing products.
- Require optimized life-cycle scores for major materials, including global warming potential, while maintaining durability and quality.
- Make the use of non-hazardous materials a priority and minimize the use of those harmful to human health or the environment.
- Sequester hazardous material in situ (where feasible and cost effective).
- Follow construction practices that maintain or improve air quality during construction, both for workers and people living in the air basin in which the project is being constructed.
- Utilize the most environmentally-friendly construction equipment available to reduce emissions.
- Follow construction-waste practices that divert at least 75 percent from landfill, unless the local regulation is higher.

- Recycle 100 percent of the steel scrap and concrete refuse generated in project construction.
- Investigate appropriateness of groundwater recharge along the alignment and make it a priority where appropriate.
- Make groundwater recharge at sites a priority and/or detain water for reuse in irrigation, while maintaining water quality.
- Reduce potable water use in design, construction and operation through water conservation strategies.
- Make life-cycle performance of components, systems and materials a priority.
- Adaptively reuse existing structures and facilities whenever feasible.
- Progressively refine requirements in design and construction contracts to achieve improved outcomes.
- Implement mitigation strategies to create long-term benefits including:
    - Working with partner agencies to modernize systems that use renewable energy.
    - Enhancing sustainable practices utilized by planning, engineering and construction teams.
    - Reducing vehicle miles traveled – and subsequently reducing statewide emission levels.
    - Building a sustainable travel alternative to support California's growing population.

In addition to these principles, the Authority adheres to the following commitments and requirements, including:

- All Environmental Impact Reports/Environmental Impact Statements (EIR/EIS) include a Mitigation Monitoring and Reporting Program (MMRP) for implementation; specifically, the:
    - MMRP for the Statewide Program EIR/EIS has 250 mitigation commitments
    - MMRP for the Bay Area to Central Valley Program EIR/EIS has 290 mitigation commitments
    - MMRP for the Merced to Fresno Project EIR/EIS has 610 mitigation commitments
- Sustainability Policy and Periodic Reporting
- American Public Transportation Association (APTA) Sustainability Commitment

4.3.2 Recycling Waste Responsibly

Waste and recycling information is collected from contractors and tracked using an online data tool. Authority recycling rates far surpass the 50 percent minimum diversion rate recommended by the California Integrated Waste Management Board and is an indicator that the Authority is performing on par with leading international sustainable construction projects.

Information on our 2016 waste management performance is reported in the 2016 Sustainability Report.

4.3.3 Ensuring Health, Safety and Security

Safety and security is the Authority's highest priority. We are working with local communities, law enforcement and first responders to design and operate a system that will be safe for our customers, drivers, pedestrians and local communities.

We will implement the highest levels of safety and security measures to ensure the protection of passengers, employees, emergency responders and the public. Our comprehensive safety and security program addresses both operations and facilities, and will also ensure that these measures enhance the passenger experience. These include:

Train Operations

- A holistic, layered, risk-based approach for securing the rail system
- Positive train control – a state-of-the-art system that monitors speeds and regulates the distances between trains and can automatically slow down or even stop trains to prevent collisions
- An early earthquake warning system to detect earthquakes before they happen to stop the trains and enable safety measures to be taken
- Grade separations – the dedicated high-speed rail right of way will have no at-grade crossings and early efforts are being made to construct:
    - 55 freight rail grade separations in the Central Valley where our corridor parallels freight lines
    - Key grade separations in Southern California including State College, Doran Street and Rosecrans Avenue/Marquardt Avenue
    - Four-quadrant gates and intrusion detection along blended corridors and the entire system, which will substantially reduce the risk of people driving onto the tracks

Facilities

- Early engagement with federal, state and local intelligence, and policing agencies during design and construction
- Ongoing engagement with the same agencies to review current and evolving criminal and terrorist threats, and applying mitigations to minimize vulnerabilities
- Applying technology, fencing, intrusion protection, surveillance capabilities and other system hardening techniques
- Development of security plans, procedures, protocols and a professional security force to monitor, patrol and respond

In addition to designing a safe high-speed rail system, we are also improving rail safety statewide. One of the most significant safety improvements that the program is implementing consists of grade separations where the existing roadway is realigned to go over or under the railway.

In the Central Valley, high-speed rail is being built to be fully grade-separated, which is essential as the trains will be traveling at speeds in excess of over 200 miles per hour in this region. The program will eliminate 55 existing rail crossings, including all of the Union Pacific Railroad crossings in the City of Fresno.

We are also planning to upgrade or eliminate grade crossings along the system through Northern and Southern California, improve safety and reliability of train operations and reduce noise (due to less need

for trains to sound warnings at crossings). It will also reduce traffic congestion at grade crossings and the GHG emissions from idling vehicles.

In Northern California, in order to implement blended service for high-speed rail and Caltrain commuter rail service within the existing corridor, the Authority and Caltrain are taking steps to prepare for service in accordance with the Federal Railroad Administration's High-Speed Passenger Rail Safety Strategy guidance. The strategy identifies four ways in which the Authority will mitigate safety risks:

1. Eliminate all redundant or unnecessary crossings together with any crossings that cannot be safer due to geometry or proximity of complex highway intersections.
2. Install the most sophisticated traffic control/ warning devices compatible with the location where train-operating speeds are between 80 and 110 mph (e.g., median barriers, special signage, possible active advanced warning, four-quadrant gates).
3. Protect rail movement with full width barriers capable of absorbing the impact of highway vehicles where train-operating speeds are between 111 and 125 mph.
4. Eliminate or grade-separate all crossings where trains travel at speeds above 125 mph.

In Southern California, the Authority is working with local agencies to finalize agreements on several critically important grade separations that will improve safety and operations for passenger and freight rail systems in the near term. Thirteen grade crossings have been identified for improvement, all of which are located in or near disadvantaged communities.

In 2016, the Authority acquired a dedicated radio spectrum for train communications. As only authorized parties will have access to these frequencies, they are ideal for secure communication between trains, Authority facilities and public safety agencies. The spectrum will be used to deliver system safety features including Positive Train Control (PTC), a state-of-the-art collision avoidance technology that allows trains, tracks and dispatch centers to actively communicate with each other.

For the statewide program, the Authority is implementing a Safety and Security Management Plan that includes the following elements:

1. The safety assurance portion of the RAMS (Reliability-Availability-Maintainability-Safety) program.
2. A hazard management program that includes hazard identification and hazard assessment in the form of preliminary hazard analyses, as well as threat and vulnerability assessments.
3. Coordination with fire and life safety agencies, such as the Office of the State Fire Marshal, Federal Railroad Administration, the Department of Homeland Security and local emergency response agencies.

The hazard assessment effort includes collaboration with the system disciplines (engineering, core systems, high-speed rail trains and operations) to develop safety and security design requirements that mitigate the risk to an acceptable level. The Safety and Security Management Plan also describes process requirements that demonstrate the achievement of Safety and Security Certification, and communication processes administered by the Safety and Security Team, including internal and external committee meetings and stakeholder outreach.

Employee Programs

To facilitate positive health outcomes, State of California employees and their eligible dependents have access to an Employee Assistance Program (EAP). This program is provided by the State of California as part of the State's commitment to promote employee health and well-being. It is offered at no charge to the employee and provides a valuable resource for support and information during difficult times, as well as consultation on day-to-day concerns. Specially trained customer service representatives and professional EAP counselors are available 24 hours a day, 7 days a week to confidentially talk with employees and get them assistance when needed. Each department also has an EAP coordinator and there is a Statewide EAP Benefits Manager available. This program is being operated by the California Department of Human Resources and more information is available here: http://www.calhr.ca.gov/employees/pages/eap.aspx.

Information on our 2016 health and safety performance and activities is reported in the 2016 Sustainability Report.

4.4 Station Communities and Community Benefit

4.4.1 Enhancing Station Communities

High-speed rail stations will serve as more than just a train stop; they will transform cities, create community hubs and anchor intermodal networks. Connecting California's major population and employment centers with high-speed rail and providing new access and mobility options at high-speed rail stations will serve as a catalyst for more compact, transit-oriented development around the stations. More compact, bike and pedestrian-friendly development enhances access to the high-speed rail system which not only increases ridership on it, but also on the local and regional transit networks that connect to it. The combined effect reduces VMT which, in turn, reduces emissions and supports broader sustainability objectives and strategies, including reduced water use and more efficient energy use.

In addition to managing capital investments in the rail system, the Authority has entered into Station Area Planning (SAP) agreements with a number of station cities and local agencies to help support land use planning, access and zoning changes to achieve highest and best use of land nearest to the stations. The Authority is using this platform to work closely with station jurisdictions and other mobility service providers in promotion of urban regeneration and district-scale sustainable development at and around the stations. Intermodal Working Groups (IWG) are making critical station area decisions and allocating funding for first-mile and last-mile connectivity projects that will link nearby sidewalks and cycling paths to stations. Connecting people to stations via all transportation modes is important to system ridership and operating without a subsidy.

Federal, state and local funds are allowing station cities and their stakeholders to engage in extensive station area planning activities in partnership with the Authority.

Station Area Planning funding is helping stimulate local planning for smart development and for updates to local land use plans and zoning codes as well as promoting transit-oriented development around high-speed rail stations. This infill aligns with critical policy objectives of Assembly Bill 32 and has the

potential to reduce millions of tons of GHG emissions.[6] Locating high speed rail stations in existing downtown cores, as envisioned by Proposition 1A, will assist with infill development, stimulate the local economy, reinforce SB 375 regional plans and reduce the pressure on agricultural land.

Access improvements and parking are focal points for early discussion and investment. The Authority is mindful of delivering necessary parking infrastructure to advance development, while prioritizing walking, biking and transit over single occupancy vehicle use.

4.4.2 Engaging Communities

Community meetings and open houses are a valuable way to gather comments and feedback from those communities that may be directly affected by the high-speed rail program.

Engaging with communities and stakeholders enables us to incorporate each community's unique values and priorities into our project plans and helps to improve community benefits while considering the collective rights of local communities. For example, community meetings on aesthetics have enabled local preferences for unique landmarks to be included in the infrastructure design.

The Authority reaches individuals and stakeholders through meetings with local community and interest groups, Authority-sponsored community and technical working groups, and other forums to discuss the program and gather feedback. The Authority's commitment to diversity and equal opportunity ensures local community engagement reaches both women and men.

4.4.3 Connecting Existing Transportation Systems

The high-speed rail program is delivering benefits now through early investments in California's existing urban and state passenger rail systems. These early investments in bookend and connectivity projects throughout the state will allow the high-speed rail system to connect with those systems, and provide an integrated rail network that will offer a viable alternative to new vehicle and air travel.

The Authority's 2012 Business Plan outlined early investments in bookend programs in Northern and Southern California, including Caltrain's Peninsula Corridor Electrification Project and enhancements to the Metrolink corridor between Palmdale and Anaheim.

In 2012, Senate Bill 1029, passed by the California Legislature and signed by Governor Brown in July 2012, appropriated almost $2 billion from the Safe, Reliable, High-Speed Passenger Train Bond Act for the 21st Century (Proposition 1A) funds for these two bookend programs and for 13 connectivity projects which will leverage approximately $5 billion in additional funding for these projects.

The 13 connectivity projects identified in SB 1029 are being implemented across the state, and include the Central Subway project in San Francisco, the Regional Rail Connector in Los Angeles, new rail cars for the Bay Area Rapid Transit (BART) system and an upgrade of the Blue Line light-rail system in San Diego. These projects were fully funded in 2015 and the Authority continued to work with its rail and transit partners on agreements to initiate and/or advance these projects through 2016.

[6] Vision California; "Charting Our Future: Statewide Scenarios Report", May 2010. https://www.hsr.ca.gov/Programs/Green_Practices/sustainability.html

4.4.4 Pre-Apprenticeship and Journeyman Upgrade Training Program

The Authority's Community Benefits Agreement (CBA) is a cooperative partnership between the Authority, skilled craft unions and contractors and is based on the Authority's Community Benefit Policy, which promotes employment and business opportunities for small and disadvantaged businesses and workers during the construction of the high-speed rail project. Additionally, under the CBA, training opportunities are promoted for all individuals so that workers gain necessary skills to advance their employment opportunities. The Policy was approved by the Authority's Board of Directors and signed by the Authority's Chief Executive Officer in December 2012.

As part of the effort to create opportunities for the local workforce, the Fresno County Workforce Investment Board offers Pre-Apprenticeship Training the purpose of which is to ensure that Central Valley job-seekers are qualified and prepared to work on construction projects such as high-speed rail. Since 2013, more than 170 students have completed the six-week training session of the Central Valley Infrastructure Employment Project.

Many training program participants go on to become apprentices and join unions for electrical workers, carpenters, laborers and the Teamsters.

4.4.5 Small Business Program

The Authority is committed to ensuring small businesses play an active role in building the high-speed rail program. The Authority's Small Business Program, spearheaded by the Authority's Small Business Advocate, is responsible for helping the Authority meet its aggressive 30 percent small business participation goal. This goal includes 10 percent participation for Disadvantaged Business Enterprises (DBEs), and 3 percent for Disabled Veteran Business Enterprises (DVBEs) and Micro-Businesses (MB).

The Small Business Program consists of robust outreach, networking and match-making opportunities between prime contractors and small business, and the Business Advisory Council that meets bi-monthly to make recommendations for ways that small businesses can participate in the program. The Authority's Small Business Advocate, with support from the regional office, also attends conventions and procurement job fairs, and holds state certification workshops in partnership with the Department of General Services and local entities.

As part of the Small Business Program, the Authority has committed to several plan components. These include prompt payment to contractors, supportive services and assistance to small businesses to ensure open communication between the Authority and its partners. The Authority's efforts will help small businesses to grow and expand.

4.4.6 Engaging Suppliers

Our Small Business Program goals also apply throughout the supply chain. We use initiatives within the supply chain to extend the benefits of the program to local businesses and suppliers. Procurement policies and practices are designed to benefit local, small and disadvantaged businesses, and to monitor the environmental impacts of purchases.

We engage suppliers through procedures, guideline specifications and contract documents to ensure that high-speed rail procurements meet our sustainability criteria.

The Authority's current design-build procurements include sustainability requirements as part of the general provisions, and all contracts include sustainability requirements.

Information on our 2016 engagement activities is reported in the 2016 Sustainability Report.

4.5 Business and Management

4.5.1 Good Governance

In order to build the high-speed rail system, the Authority is entrusted with resources. We take our responsibility to use these resources on behalf of all Californians seriously. The Authority is governed by a number of regulations to ensure the development of a system that is safe, sustainable and compliant with applicable laws and requirements, including:

- Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century (Proposition 1A, 2008)
- AB 32 (Nunez, 2006) Global Warming Solutions Act
- SB 32 (Pavley, 2016) Global Warming Solutions Act, 2006: Emissions Limit
- SB 375 (Steinberg, 2008) Sustainable Communities and Climate Protection Act
- AB 75 (Strom-Martin, 1999) Waste Management for State Agencies
- SB 1029 Budget Act of 2012
- SB 852 Budget Act of 2014
- SB 862 (2013-2014) Greenhouse Gases: emissions reduction
- SB 535 (De Leon, 2012)
- AB 1532 (Perez, 2012)
- SB 350 (De Leon, 2015) Clean Energy and Pollution Reduction Act
- SB 379 (Jackson, 2015) Land Use: General Plan: Safety Element: Climate Adaptation
- Executive Order B-18-12
- Executive Order B-30-15
- 2008 California Long-term Energy Efficiency Strategic Plan
- 2008 Air Resources Board Scoping Plan; 2013 Update
- 2016 California Green Building Standards Code (CalGreen Code) Title 24 Part 11
- AB 1550 (Gomez, 2016) Greenhouse Gases: Investment Plan: Disadvantaged Communities

The Authority extends its reach through contractor, subcontractor and supplier requirements to ensure good governance and transparency in everything we do. In 2016, the Authority received no fines related to these regulations

4.5.2 Financial Responsibility

A key feature of the high-speed rail system will be self-sufficient operation through revenues generated from ticket sales without a subsidy. The following statutes guide our financial decision-making:

- Assembly Bill 115 (Com. on Budget, Chapter 38, Statutes of 2011): Budget Act of 2011

- Senate Bill 1029 (Com. on Budget, Chapter 152, Statutes of 2012): Budget Act 2012
- Senate Bill 852 (Leno, Chapter 25, Statues of 2014): Budget Act of 2014

Additional financial responsibility activities undertaken by the Authority include:

- Managing the Authority's Administrative Budget in conformance with State of California requirements
- 100 percent compliance with all existing financial obligations and tracking mechanisms
- Preparing biannual business plans
- Finance and Audit Committee public meetings and monthly reporting
- Completing the bi-annual Project Update Report

Capital funding to develop the high-speed rail project comes from federal, state, local and private sources. These funds will be available to the Authority at different times based on the development timeline of the system.

As of 2016, the Authority has received funding commitments of $3.5 billion from the Federal Government, $9.9 billion from Proposition 1A bond proceeds and 25 percent of annual Cap and Trade proceeds on a continuous basis plus one-time appropriations, facilitated by California Air Resources Board programs.

Of these funds, $1.05 billion has been identified for planning and environmental activities across the Phase 1 system, including $315 million from the Federal government, $675 million from Proposition 1A bond proceeds and $59 million from Cap and Trade proceeds.

$5.8 billion has been allocated to construction in the Central Valley, including $3.2 billion from the Federal Government and $2.6 billion from Proposition 1A bond proceeds. Additional Cap and Trade proceeds will fund capital costs for the Silicon Valley to Central Valley line through 2024.

Full details of program funding and financing are available in the 2016 Business Plan (http://www.hsr.ca.gov/About/Business_Plans/2016_Business_Plan.html). Monthly Finance and Audit Committee updates to the Board can be found here: http://www.hsr.ca.gov/Board/monthly_fa_committee_meeting.html/. Details of funding agreements can be viewed online here: http://www.hsr.ca.gov/About/Funding_Finance/funding_agreements.html.

4.5.3 Job Creation

A positive benefit of the Authority's governance process is local economic development through job creation.

Construction in the Central Valley is creating thousands of jobs while also employing hundreds of small businesses. This includes, but is not limited to, regional consultants doing environmental work and preliminary engineering, right-of-way teams doing survey and appraisal work, the design-build contractors (and their employees and subcontractors and their employees) doing final design and construction, and utility relocation. As well, permanent jobs for train operators, maintenance yard workers, stations managers and others will be created in the future to operate and maintain the system.

The Central Valley has recently faced challenges to economic recovery, including an unemployment rate in the construction industry of over 30 percent. High-speed rail construction jobs will go to the people who need them most, providing a significant boost to California's economy as a whole. As reported by the University of the Pacific Eberhardt School of Business the Fresno economy has experienced reduced unemployment rate to single digits for the fourth year in a row Fresno unemployment is below 10 percent reversing a trend for the past 25 years.[7]

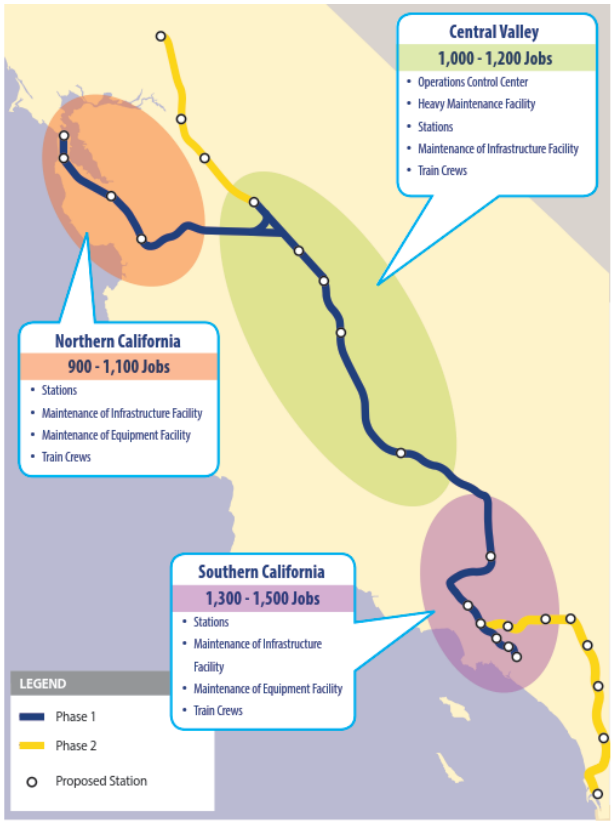
Additionally, connectivity and bookend projects, part of the rail modernization to build high-speed rail, will provide jobs in Southern and Northern California.

Once operational, the high-speed rail program will provide improved connectivity between California's major economic regions, providing significantly more transportation capacity for people traveling between them. This will help reduce congestion on freight lines, and along the highway system. As a result, California's economy will become more efficient and competitive as goods move more freely, and less time is wasted in cars and at airports.

Information on our 2016 job creation performance is reported in the 2016 Sustainability Report.

[7] California and Metro Forecast, May 2016, University of the Pacific.

Exhibit 8: Anticipated Regional Job Creation and Key Works



4.5.4 Opportunities for Disadvantaged Workers

Building and operating the high-speed rail program will directly employ thousands of Californians, while indirectly generating tens of thousands more jobs throughout the economy. Construction on the first segment between Madera and Kern County is projected to create thousands of jobs over the next five years. To ensure that these jobs benefit communities most in need, the Authority Board of Directors approved a Community Benefits Policy in 2012 with the goal of promoting the hiring of California community businesses and residents during construction and that supports employment of individuals who reside in Disadvantaged Areas and those designated as Disadvantaged Workers, including veterans.

Our Community Benefits Agreement contains a Targeted Worker Program which ensures that 30 percent of all project work hours are performed by National Targeted Workers, and at least 10 percent of those work hours shall be performed by Disadvantaged Workers.

A Targeted Worker is an individual whose primary place of residence is within an Economically Disadvantaged Area or an Extremely Economically Disadvantaged Area in the United States. A Disadvantaged Worker is an individual who, prior to commencing work on the high-speed rail project, meets the income requirements of a Targeted Worker and faces at least one of the following barriers to employment:

- Being a veteran
- Being a custodial single parent

- Receiving public assistance
- Lacking a GED or high school diploma
- Having a criminal record or other involvement in the criminal justice system
- Suffering from chronic unemployment
- Emancipated from the foster care system
- Being homeless
- Being an apprentice with less than 15 percent of the required graduating apprenticeship hours in a program

The job training that people will receive through this policy will later permit workers to be employed on other construction projects, delivering lifetime benefits.

4.5.5 Fostering Diversity and Equal Opportunity

The Authority strongly believes in equal opportunity for all and strength in diversity. We are committed to ensuring that no person shall, on the grounds of race, color, national origin, sex, age or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity in the design, construction and operation of the high-speed rail system. Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color or national origin in programs or activities receiving federal financial assistance. The rights of women, the elderly and the disabled are protected under related statutes.

To comply with Title VI, the Authority has a specific policy and provides free language assistance whenever Limited English Proficiency (LEP) individuals request assistance. An LEP individual is a person who does not speak English as their primary language and who has limited ability to read, write, speak or understand English. We are also working to ensure that we provide fair treatment to people of all races, cultures and income levels, including minority and low-income populations, with respect to the development, adoption, implementation and enforcement of environmental laws and policies through our Environmental Justice (EJ) program. We incorporate EJ considerations into our program, policies and activities to mitigate disproportionate adverse impacts, particularly on minority LEP, and low-income populations.

More about the Authority's Title VI program can be found here: http://hsr.ca.gov/Programs/title_VI_program.html.

4.5.6 Worker Protections

All Authority staff and consultants are covered by the Fair Labor Standard Act (FLSA) and/or union bargaining agreements that define labor conditions and wages. All construction workers follow a bargaining unit agreement or are protected by the FLSA.

5 Stakeholder Engagement

We recognize that trust and support are vitally important to what we do. Engaging our many stakeholders from a federal, statewide and local community level provides the Authority with invaluable insight, and helps inform and strengthen our key decisions.

The Authority's Office of Communication is responsible for initiating and coordinating outreach throughout the state. The public, our partners and the media are engaged through speaking engagements, meetings, community open houses and social media.

The Authority's Office of Legislation is responsible for engaging elected officials at the state and federal level. This includes working with legislators and their staff to keep them up-to-date on the high-speed rail program. The Office also works closely with the Authority's federal liaison, who keeps the U.S. Congress and federally-elected officials apprised of the program's progress.

Key topics and issues often raised through stakeholder engagement include:

- Cost
- Schedule
- Alignment choices
- Compliance with enabling legislation

These issues are addressed through the publication and regular update of project information on the Authority's website, presentations, information sharing at open house sessions, responses to information requests, provision of technical reports and background data related to business plan development, and specialized reports including the small business and jobs reports.

North

In Northern California, the Authority took steps to advance environmentally clearing the high-speed rail alignment from San Francisco to the Central Valley Wye and keep stakeholders in the North updated on project developments. We worked with the existing Local Policy Maker Group and the City/County Staff Coordinating Group conducting working groups and alignment tours, and implementing additional open house meetings.

Central Valley

In the Central Valley, the Authority continued to advance major construction activities within Construction Package 1. The Authority and Dragados/Flatiron, a Joint Venture (DFJV) team continued outreach in the areas of CP 2-3 while beginning some site clearance and initiated outreach for Construction Package 4. Our Fresno staff continued to work with property owners and our partners to prepare for construction.

South

In Southern California, the Authority continued to engage communities in project sections that will obtain environmental clearance in 2017. Our team started environmental documentation and progress updates. We also implemented a Small Business outreach strategy and events to enhance small business participation.

6 Acknowledgments

Thanks to all our federal, state, regional and local municipality partners as well as our environmental and community non-profit and advocacy partners who contributed to this report and with whom we are delivering the rail system.

7 Glossary

Bio Diesel: Biodiesel is a diesel replacement fuel made from new and used vegetable oils or animal fats that have been chemically reacted with an alcohol. Biodiesel is also made from canola oils and from waste stream sources including used cooking oils or animal fats.

Black Carbon: Black Carbon is a component of fine particulate matter. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation and darkens the surface of snow and ice, which accelerates heat absorption and melting. Diesel particulate matter emissions are a major source of black carbon and are also toxic air contaminants.

CALGreenCode: The California Green Building Standards Code is Part 11 of the California Building Standards Code, and defines and encourages sustainable construction practices for residential and non-residential buildings.

Carbon Offsets: Emissions reductions that have been made elsewhere, which are then sold to the entity that seeks to reduce its impact.

Criteria Air Pollutants: Six common air pollutants regulated by the US Environmental Protection Agency due to their potentially harmful human health and environmental impacts. These pollutants include particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides and lead.

Direct GHG Emissions: Emissions from sources that are owned or controlled by the reporting entity.

Indirect GHG Emissions: Emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity.

Disadvantaged Community: Distinguished by higher risk of environmental hazards and/or lower socioeconomic status. Disadvantaged communities are the target of some high-speed rail programs. Criteria the California Environmental Protection Agency uses to identify disadvantaged communities include but are not limited to:

- Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure or environmental degradation.
- Areas with concentrations of people that are of low income, high unemployment, low levels of home ownership, high rent burden, sensitive populations, or low levels of educational attainment.

Environmental Product Declaration (EPD): A standardized statement summarizing environmental impacts throughout the product life-cycle. EPDs may include information about global warming potential, ozone depletion, acidification, eutrophication, smog or other environmental impact areas.

Greenhouse Gas (GHG): Greenhouse gases trap energy in the atmosphere and are the primary driver of climate change and global warming. The United Nations Intergovernmental Panel on Climate Change (IPCC) defines six gases under this category: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs – a family of gases), fluorocarbons (PFCs – another family of gases) and sulfur hexafluoride (SF6). Carbon emissions are measured in the unit "carbon dioxide equivalent" (CO_2e) and expressed in metric tonnes ($MtCO_2e$).

Leadership in Energy and Environmental Design (LEED): LEED certification provides independent, third-party verification that a building, home or community was designed and built using strategies aimed at achieving high performance in the following key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

Net-Zero Energy: Refers to a facility or system that produces as much energy as it uses over the course of a year (or other defined period).

Particulate Matter (PM): Particulate matter is an air pollutant made up of extremely small particles and liquid droplets. Small particles 10 micrometers (PM10) in diameter or less can be inhaled into the lungs, causing serious respiratory and circulatory health effects. Smaller particles of 2.5 micrometers (PM2.5) in diameter or less are also a significant contributor to haze. A component of particulate matter called black carbon can disrupt climate patterns.

Photovoltaic (PV): Technology using semiconductor material to convert sunlight into electricity. Power is produced when sunlight strikes the semiconductor material and creates an electric current.

Post-consumer Recycled Content: A material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item.

Pre-consumer Recycled Content: Material diverted from the waste stream following an industrial process that is capable of being reclaimed within the same process.

Reactive Organic Gases: Carbon-based gases (excluding carbon monoxide and carbon dioxide) that can react with other chemicals and light to produce smog and ozone.

Recycling: Material recovery from the solid waste stream for use in the manufacture of new products.

Renewable Energy: Energy resources such as wind power or solar energy that can be produced indefinitely without being depleted.

Senate Bill 375 (Steinberg, 2008): SB375 sets regional targets for greenhouse gas emissions reductions and requires cities and counties to address GHG reductions through a Sustainable Communities Strategy in the regional transportation plan.

Sustainability: Sustainability is the capacity to endure. Sustainable thinking recognizes how current decisions affect the capacity of current and future generations to lead healthy and rewarding lives.

Sustainable Transportation: Transportation that does not rely on the use of fossil fuels.

Vehicle Miles Traveled (VMT): The total number of miles traveled by vehicles in a given geographic boundary over a specific time.

8 Quantification Methodologies

Values reported in 2016 Sustainability Report are quantified according to the following methodologies:

Energy

Office energy consumption is estimated from the number of Authority employees and consultants, along with the average energy intensity and occupant density of LEED-certified buildings. Electricity consumption is converted from kilo-BTU (kBTU) to kilowatt hours (kWh) using a conversion factor from EPA Climate Leaders GHG Inventory Protocol, Appendix 2: Unit Conversions.

Fuel consumption is tracked for construction activities, and is converted from gallons to gigajoules (GJ) using conversion factors from EPA Climate Leaders GHG Inventory Protocol, Appendix 2: Unit Conversions.

GHG Emissions

The Authority takes the operational control approach to quantifying GHG emissions, and has adopted 2015 as its baseline year for reporting on emissions changes over time. GHG emissions are quantified in accordance with the GHG Protocol Corporate Standard, California Air Resources Board methodologies, and EPA models, as described below. All relevant greenhouse gases are included.

Scope 2 GHG emissions are calculated from annual electricity consumption, and emissions factors sourced from US EPA (2012) eGRID for California (CAMX).

Scope 3 emissions from contractor vehicles are calculated using EMFAC2011 emissions rates from the California Air Resources Board.

Scope 3 emissions avoided through materials recycling are calculated using the amount of construction materials recycled and the EPA Waste Reduction Model (WARM).

Anticipated GHG emissions reductions during systems operations are calculated according to the methodology available online at: http://www.hsr.ca.gov/docs/programs/green_practices/HSR_Reducing_CA_GHG_Emissions_2013.pdf. All greenhouses relevant to the activities are included (CO_2, CH_4, N_2O). Reductions are reported relative to a scenario without high-speed rail, rather than relative to a baseline year. Emissions reductions occur as a result of the service provided by high-speed rail, so are classified as scope 3 emissions reductions.

Air Pollutant Emissions

Air pollutant emissions from construction vehicles are calculated using the methodology and EMFAC2011 emissions rates from the California Air Resources Board.

Criteria pollutants are the most significant air pollutants related to human health and environmental impacts. Other categories of air emissions, such as persistent organic pollutants, volatile organic compounds and hazardous air pollutants, are not quantified.

Water

Office water consumption is estimated from the number of Authority employees and consultants, along with the average water intensity and occupant density of LEED-certified buildings. Construction water consumption is tracked and reported. Water consumption is from municipal sources.

Waste

Waste and recycling information is collected from contractors and tracked using an online data tool. Waste generation and disposal weights are recorded from records received from recycling and waste treatment facilities. Diversion rates are calculated by dividing the weight of materials diverted (through recycling, reuse and stockpiling) by the total materials weight.

Job Creation

Hours worked data come from certified payroll submissions while the number of workers is based on monthly submittals from prime contractors in compliance with the National Targeted Hiring Initiative (NTHI).